

from those low and degrading gratifications which are the ruin of so many.

Mr. H. Cope seconded the resolution, and read extracts from letters from Lords Normanby, Sandon, Howick, Teignmouth, F. Egerton, and Grosvenor, Col. Fox, Sir H. Vivian, Capt. Rous, and a large number of members of both houses of Parliament, bearing strong testimony to the desirableness of the object in view. A deputation had recently waited on Sir James Graham, who had promised assistance. He (Mr. Cope) trusted that, as the north-western and north-eastern portions of the metropolis had spaces of ground reserved by Government for public recreation, the boroughs of Southwark and Lambeth would urgently press their claims for a similar privilege.

The resolution was carried.

The places suggested for parks or public walks in Lambeth and Southwark were as follow:—The plot of ground between High-street, Newington, and Walcott-terrace, Lambeth, bounded by Walcott-square and Chester-street, and Lower Kennington-lane; the Kennington-common and fields at the back towards the Surrey Zoological Gardens and Walworth-road; Battersea-fields; the fields between Bermondsey New-road and Grange-road, Old Kent-road; the fields on either side of the Deptford Lower-road; the Kennington Oval and fields towards the South Lambeth and Clapham-roads; Vauxhall Gardens and the adjoining grounds.

Measures will be taken in the course of a few days to carry the resolution, as well as some minor ones which were passed, into effect.

Thanks were voted to the Rev. Chairman by acclamation.

THE COFFER-DAM AT WESTMINSTER BRIDGE.

SUCH of our readers as are in the habit of travelling on the Thames to Westminster have no doubt observed that very extensive works are going on, having for their object the repair and restoration of that structure. Few of them are, however, aware that within that huge and ugly mass of piling one of the most difficult and dangerous operations of engineering—namely, that of restoring the foundation of an arch injured by the action of the tide, is at this moment in a course of successful operation.

For some years past it has been known that the foundations of Westminster-bridge have suffered seriously, and in fact have become undermined to a considerable extent by the wash of the river. The consequence of this has been a settlement of the various piers, attended with an extensive alteration of the original level of the arches and roadway; added to these evils, it has been for some time obvious that, from the soft nature of the stone of which the bridge was originally constructed, those parts of the piers which were exposed to the action of the atmosphere by the alternate rising and falling of the tide, had become seriously injured.

To remedy these evils, and to restore those parts of the stone which had suffered, became a matter of such imperative necessity, that the assistance of Mr. Walker, the eminent engineer, was called in to devise means by which these desiderata could be effected.

Upon that gentleman proceeding to make his examination of the foundation of the bridge, he discovered that the edges of the caissons on which the piers of the arches were originally built, and which extended a short distance beyond the face of the superincumbent masonry, had become completely undermined, and that although those parts on which the piers rested were as yet perfectly solid and in good condition, though in some cases sunk below their original level, yet that their projecting ends were completely forced upwards, and that the wash of the tide was hourly working under their edges, thus rendering the foundations on which the piers rested extremely insecure. Upon his making his report to the proper authorities, embodying these facts, it was determined to lose no time in applying a remedy to the evil, and to the engineer himself was intrusted the difficult task of carrying his own recommendations into effect.

Mr. Walker accordingly commenced his

labours by forming an extensive coffer-dam by driving down two rows of piling into the clay lying below the gravelly bed of the river, and, having done this, the whole of the gravel and clay between the inner and outward faces of the coffer-dam was excavated down to a considerable depth below the level of the caissons. He then caused to be filled up the space thus excavated with puddling, thus excluding the possibility of any leakage, whatsoever, either through or under the piling, and by which a certainty was obtained of carrying on the works, not merely without the occasional interruption from water, but to perfect dryness at all times. Having succeeded in securing his coffer-dam, the whole of the water, gravel, sand, and soil, between the inner face of the coffer and the foundations of the piers, was removed to a level of three feet below that of the caissons themselves, which were left perfectly dry. To restore the foundations to their original state of security, Mr. Walker has surrounded the whole of the piers at a distance of six feet from the facing of the stone-work with a series of piles of green beech 15 feet long, with their lower ends driven many feet into the clay, and their upper extremities cut off flush at a level with the edge of the foundations. The accuracy and beauty of adjustment of this portion of the work is perfectly wonderful, and resembles more the nicety of cabinet work than the rough appearance of engineering on a great scale. This range of piling is in its turn surrounded on its outer face by walling pieces bolted on to it at distances of every two or three feet, the bolts extending through the piling, and made fast to the bed of the caisson itself. The space between the inner piling and the caisson has then been filled up within a short distance of the top with concrete, on which is laid squared masonry paving eighteen inches in thickness, and fitting between the inner edge of the piling and the outer edge of the caisson with the utmost accuracy. The piers of the bridge themselves on the southern side are carried out or extended some twelve feet beyond the face of the original pier, and are based on platforms of wood, resting at distances of three feet on bearing piles. The whole of the masonry is executed in Bromley full-stone, cemented with pozzolano cement. The new facings of the piers, which are of this material, are on an average about two feet thick, that is to say, the headers are two feet six inches thick, and the stretchers one foot six inches, and they have dorettailed joints fixing into each other. It will thus be observed that the outer edges of the caissons on which the piers rest are completely surrounded and defended from the under-wash of the water; and the foundations are extended and rendered completely solid—first, by the beech piling, which being at all times covered with water, and never exposed to alternations of wet and dry, may be supposed to be almost imperishable; and secondly, by the intervening concrete and stone covering.

The under surfaces of the piers and arches are in the course of being completely repaired, and, where necessary, faced and lined with fresh stone-work, and the manner in which this is effected where the arch stones themselves are injured or unsound, is equally curious and ingenious. In the first place, the diameter and form of the stone to be replaced having been determined by very accurate measurement, three pieces of stone are prepared, which, when placed together, exactly correspond with the size of that to be displaced, the injured arch-stone is then cut out, and a large piece corresponding exactly with the shape of the lower portion of that removed—that is to say, having its inner surface larger than its exposed face—is then laid in its place, but having upon its lower surface a projection or joggle fitting into a cavity in the lower stone on which it rests. The two upper portions, which are almost in the shape of perfect cubes, are then placed upon the top of the new stone, and are fastened to it in this manner:—Corresponding holes are made on the surface of the upper and lower stones, in the hole of the upper one a sort of slate bolt is fixed, which is prevented from falling out of it by a slight string attached to it, and which keeps the end of it level with the surface of the stone in which it is eventually to enter. Upon this latter being put into its proper place, with the hole on its

lower surface containing the bolt brought completely over the corresponding hole in the lower stone, the string is cut, and the bolt permitted to fall with its lower end into the under stone, and part of its upper end remaining in the upper stone, which completely connects the one with the other, and renders it perfectly impossible that they should become disconnected.

Of the way in which those parts of the work which have been completed are executed, it is impossible to speak too highly; they are solid, substantial, and perfect, and may be quoted as specimens of good work.

Those, however, who admire ingenuity would do well to pay this caisson a visit. They would find there much to please and much to instruct, and would be well repaid the trouble of a ride to Westminster.—*Times*.

BRITISH ARCHITECTS.

N. Hawkmoor

THE fac-simile presented to the reader is that of NICHOLAS HAWKMOOR, a name which, though not celebrated in the annals of British architecture, has indubitable claim to respectful mention. The signature itself is one of those curious abbreviations rarely met with, and we have not been able to find a second to confirm its being his accustomed mode; there is, however, an off-hand firmness about it which seems to have been habitual. There is not, within the compass of ordinary research, any record of the time or place of his birth; all we are able with certainty to collect is, that at eighteen years of age he was a pupil in the office of Sir Christopher Wren, and thus early in life commenced an industrious and useful career, accompanied by the entire confidence of his instructor, to whom he proved throughout a most able assistant. Hawkmoor's was one of those plodding minds content to labour diligently in its vocation, leaving few traces beyond those incidental to active, though subordinate, co-operation in great works. We find that in the last two or three years of the reign of Charles the Second, he had already sufficient ability to be intrusted as clerk of the works at the intended palace of that monarch at Winchester, and there is no doubt he was similarly employed during the progress of other extensive undertakings in which Sir C. Wren was engaged. When, however, opportunity occurred, his patron did not omit putting him forward into more ostensible situations. At the building of Chelsea Hospital he held the public appointment of deputy surveyor, and still later, with greater emolument attached, the same office at Greenwich Hospital, and in that capacity furnished the report presented to Parliament of the completion of the building, and the extent of accommodation it was calculated to afford to the naval veterans for whom it was designed.

The declining interest of Sir C. Wren had no unfavourable influence upon the steady and unpretending course of his pupil, but rather the contrary. Benson, who may be termed the official successor of the former, had no qualifications to recommend him save the united voices of the German *colerie* who so freely disposed of court patronage after the death of Queen Anne. The reign of the first sovereign of the Brunswick family, a blank in all that related to cultivation of the arts, was ungraced by any ministrings to taste or national splendour; and in the eyes of the newly imported foreigners, the buildings of London were, by comparison with those of the petty capital they had quitted, already too insignificant. Benson had, therefore, little to do in the superior department of the profession he had assumed, and wisely covered his deficiencies in less important matters by appointing Hawkmoor clerk of the works for the palaces of Kensington, St. James's, and Whitehall. This position also gave the latter influence with the commissioners for building churches, and those of St. George, Bloomsbury, Christ Church, Spitalfields, and St. Ann's, Limehouse, are of his design and execution.